DRAFT TIME CRITICAL REMOVAL ACTION SEDIMENT FIELD SAMPLING PLAN

SAN JACINTO RIVER WASTE PITS SUPERFUND SITE

Prepared for

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International Paper Company
U.S. Environmental Protection Agency, Region 6

Prepared by

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TABLE OF CONTENTS

List of Tables

List of Figures

LIST OF ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition
Anchor QEA	Anchor QEA, LLC
CDF	confined disposal facility
COC	chain-of-custody
DGPS	differential global positioning system
FL	Field Lead
FSP	Field Sampling Plan
GPS	global positioning system
HASP	Health and Safety Plan
I-10	Interstate Highway 10
Integral	Integral Consulting Inc.
IPC	International Paper Company
MIMC	McGinnes Industrial Maintenance Corporation
NOAA	National Oceanic and Atmospheric Administration
QA	quality assurance
QA/QC	quality assurance and quality control
QC	quality control
RI/FS	Remedial Investigation and Feasibility Study
Site	San Jacinto River Waste Pits Superfund Site
SJRWP	San Jacinto River Waste Pits
SOP	standard operating procedure
TCRA	time critical removal action
TOC	total organic carbon
USEPA	U.S. Environmental Protection Agency

1 INTRODUCTION

This document presents the Field Sampling Plan (FSP) that was prepared on behalf of McGinnes Industrial Maintenance Corporation (MIMC) and International Paper Company (IPC) for the 2010 Time Critical Removal Action (TCRA) sediment study at the San Jacinto River Waste Pits (SJRWP) Superfund Site (the Site). The sediment sampling design in this FSP was developed by the U.S. Environmental Protection Agency (USEPA) and submitted to MIMC and IPC by email on Friday, March 26, 2010. This FSP was prepared by Anchor QEA, LLC (Anchor QEA) and Integral Consulting Inc. (Integral) on behalf of MIMC and IPC at the request of the USEPA, and Anchor QEA is planning to implement the sampling event the week of April 12, 2010.

The Site is located on the western bank of the San Jacinto River, immediately north of the Interstate Highway 10 (I-10) Bridge, in Harris County, Texas (Figure 1). The property was acquired for the disposal of paper mill waste sludge from the Champion Paper Company in Pasadena, Texas. The on-Site impoundments are believed to have been used in the mid-1960s for disposal of paper mill waste sludge, which were reportedly brought to the Site by barges (TCEQ and USEPA 2006). The TCRA study is one of the tasks that will be conducted as an early response action for source control and Site stabilization.

1.1 Project Organization

MIMC and IPC have retained Anchor QEA and Integral to perform the RI/FS. The primary contacts for USEPA, MIMC, and IPC are provided in the following table.

USEPA and Respondent Project Managers

Title	Name	Contact Information
USEPA	Valmichael Leos	U.S. Environmental Protection Agency Region 6 1445 Ross Avenue Dallas, TX 75202-2773 (214) 665-2283 leos.valmichael@epa.gov

Remedial Project Manager McGinnes Industrial Maintenance Corporation Project Manager	Andrew Shafer	McGinnes Industrial Maintenance Corp. 9590 Clay Road Houston, TX 77080 (713) 772-9100 Ext. 109 dshafer@wm.com
International Paper Company Project Manager	Philip Slowiak	International Paper Company 6400 Poplar Avenue Memphis, TN 38197-0001 (901) 419-3845 philip.slowiak@ipaper.com

The names and quality assurance (QA) responsibilities of key project personnel for Anchor QEA and Integral who will be involved in these sampling and analysis activities are provided below.

Project Personnel Quality Assurance Responsibilities

Title	Responsibility	Name	Contact Information
Project Coordinator	Coordination of project information and related communications on behalf of IPC and MIMC with USEPA; liaison between USEPA project managers and respondent project managers	David Keith	Anchor QEA, LLC 2113 Government Street Building D, Suite 3 Ocean Springs, MS 39564 (228) 818-9626 dkeith@anchorqea.com
Anchor QEA Project Manager	Project planning and implementation; liaison between respective internal and external team members and project coordinator	David Keith	Anchor QEA, LLC 2113 Government Street Building D, Suite 3 Ocean Springs, MS 39564 (228) 818-9626 dkeith@anchorqea.com
Integral Project Manager	Responsible for coordination with the Anchor QEA project manager, the IPC project manager, and the MIMC project manager to execute the study described in this FSP	Jennifer Sampson	Integral Consulting Inc. 411 1st Avenue South Suite 550 Seattle, WA 98104 (206) 957-0351 jsampson@integral-corp.com
Anchor QEA and Integral Corporate Health and Safety Managers	Oversight of health and safety program for field tasks associated with RI/FS	David Templeton	Anchor QEA, LLC 1423 Third Avenue Suite 300 Seattle, WA 98101 (206) 287-9130 dtempleton@anchorqea.com

		Eron Dodak	Integral Consulting Inc. 319 SW Washington Street Suite 1150 Portland, OR 97204 (503) 284-5545 edodak@integral-corp.com
Field Lead Anchor QEA	Field data collection and implementation of the Health and Safety Plan in the field	Jason Kase	Anchor QEA, LLC 4208 Cherry Laurel Drive Pensacola, FL 32054 (850) 912-8400 jkase@anchorqea.com
Project Database Administrator Integral	Database development and data management	Dreas Nielson	Integral Consulting Inc. 411 1st Avenue South Suite 550 Seattle, WA 98104 (206) 957-0351 dnielson@integral-corp.com
Project Laboratory QA Coordinator Integral	Completeness of QA documentation and procedures; liaison between project personnel, laboratories, and data validators and for related QA communications with USEPA	Craig Hutchings	Integral Consulting Inc. 1205 West Bay Dr. NW Olympia, WA 98502 (360) 705-3534 chutchings@integral-corp.com

1.1.1 Laboratories

The following responsibilities apply to the project manager and QA (quality assurance) manager at the analytical laboratories used for this task.

The laboratory project manager is responsible for the successful and timely completion of sample analyses, and for performing the following tasks:

- Ensure that samples are received and logged in correctly, that the correct methods and modifications are used, and that data are reported within specified turnaround times.
- Review analytical data to ensure that procedures were followed as required in the FSP, the cited methods, and laboratory standard operating procedures (SOPs).
- Keep the task QA coordinator apprised of the schedule and status of sample analyses

and data package preparation.

- Notify the task QA coordinator if problems occur in sample receiving, analysis, or scheduling, or if control limits cannot be met.
- Take appropriate corrective action as necessary.
- Report data and supporting QA information as specified in this FSP.

The laboratory QA manager is responsible for overseeing the QA activities in the laboratory and ensuring the quality of the data for this project. Specific responsibilities include the following:

- Oversee and implement the laboratory's QA program.
- Maintain QA records for each laboratory production unit.
- Ensure that QA and quality control (QC) procedures are implemented as required for each method and provide oversight of QA/QC practices and procedures.
- Review and address or approve nonconformity and corrective action reports.

Coordinate response to any QC issues that affect this project with the Laboratory Project Manager.

1.2 Objectives and Overview

The primary objective of the 2010 TCRA sediment study is to generate data that can be used to define the extent of a planned TCRA that will involve stabilizing potential dioxin and furan contaminated waste in the Site waste impoundment perimeter.

The sediment and soil sampling design for the TCRA was developed by the USEPA and submitted to MIMC and IPC by email on Friday, March 26, 2010. This FSP can be summarized as follows:

- Surface sediment and soil sampling and analysis of dioxins and furan congeners and total organic carbon (TOC) at 25 locations in and near the impoundments (Figure 2).
- Stations are located along five transects, with five stations located within each transect.

This FSP describes the field methods that will be used to collect soil and sediment for the TCRA sediment study. Section 2 of this FSP describes the field procedures and sample packaging and shipping requirements that will be followed by the technical team during the field study. Section 3 summarizes field documentation and chain-of-custody (COC) procedures. Field data reporting and field custody procedures are discussed in Section 4.

2 SAMPLING PROCEDURES

The following sections describe the detailed procedures and methods that will be used during this sampling event, including sampling procedures, recordkeeping, sample handling, storage, and field QC procedures. All field activities will be conducted in accordance with the Health and Safety Plan San Jacinto River Waste Pits Superfund Site (HASP; Anchor QEA 2009). Station locations and sampling matrices are outlined in Table 1.

2.1 Schedule

This sampling event will occur in mid April 2010, as directed by USEPA. Sampling is scheduled to begin on Tuesday, April 13, 2010, and be completed on Thursday, April 15, 2010, if weather and other uncontrollable forces, such as tides, winds, etc. permit adequate Site access.

2.2 Field Survey and Sampling Methods

Surface sediment and soil chemistry samples will be collected at station locations determined by USEPA (Figure 2). The following sections describe the sampling equipment, sampling methods, sample handling, and shipping.

2.2.1 Sampling Vessel, Field Equipment, and Supplies

Access to river sediments will require the use of either a boat or a barge. Two stations will be located on land within the western impoundment; however, access into these locations will likely occur by foot after accessing the shoreline of the impoundment by boat.

2.2.1.1 Sampling Vessel

The sampling boat will have enough space to accommodate a minimum of four people—two sampling team members, the vessel's operator, and one USEPA oversight individual—and the following gear: sediment collection and compositing equipment, sample coolers, and multiple sampling equipment boxes containing sample jars and other ancillary equipment. The vessels used for sampling will have navigational lights, anchors, and basic sonar (e.g., fathometer). The vessel operator will be thoroughly familiar with the area of the river to be navigated.

Weather, river gauge height, and tides will be monitored using the following web sites:

- Weather conditions and forecasts: National Oceanic and Atmospheric Administration (NOAA) site for the Houston/Galveston area (http://www.weather.gov/forecasts/wfo/sectors/hgx.php#tabs)
- Real-time stream elevation: U.S. Geological Service (USGS) 08072050 San Jacinto River near Sheldon, 10 miles upstream from the Site (http://waterdata.usgs.gov/nwis/uv?site_no=08072050)
- Real-time data on wind direction, wind speed, and water elevation: USGS 08077637 Clear Lake Second Outflow Channel at Kemah, 22 miles south of the Site (http://waterdata.usgs.gov/nwis/uv?site_no=08077637)
- Tides: NOAA site at Battleship Texas State Park, Station Id: 8770743, 3 miles southwest of the Site (http://tidesandcurrents.noaa.gov/noaatidepredictions/viewDailyPredictions.jsp?Stationid=8770743)

2.2.1.2 Field Equipment and Supplies

Field equipment and supplies include sampling equipment, utensils, decontamination supplies, sample containers, coolers, shipping containers, log books and forms, personal protection equipment, and personal gear. Protective wear (e.g., gloves) is required to minimize the possibility of cross-contamination between sampling locations. Additional information on protective wear required for this project is provided in the HASP.

Surface sediment samples (6 inches; 15 cm) will be collected using a modified petite-Ponar grab sampler or a pole mounted Eckman dredge. The petite-Ponar will be modified with doors on the top to allow access to the undisturbed sediment surface.

Sample jars, preservatives, coolers, and packaging material for the samples will be supplied by the analytical laboratory. Details on the numbers and type of sample containers are provided in Table 2 of this FSP. The Field Lead (FL) and field personnel in charge of sample handling in the field will use a sample matrix table (Table 1) as a QC check to ensure that all samples have been collected at a given station. This table includes the total number and type of sample jars required for each analysis at each sampling station.

Commercially available, pre-cleaned jars will be used for the samples, and the testing laboratories will maintain a record of certification from the suppliers. The bottle shipment documentation will include batch numbers. With this documentation, jars can be traced to the supplier, and bottle-wash analysis results can be reviewed. The bottle-wash certificate documentation will be archived in Integral's project file.

Sample containers will be clearly labeled at the time of sampling. Labels will include the task name, sample number, sampler's initials, analyses to be performed, and sample date and time. Sample numbering and identification procedures are described in detail in Sections 3.3 and 3.4.

2.2.2 Sample Location Positioning

Latitude and longitude coordinates will be obtained at the locations where samples are collected. A differential global positioning system (DGPS) will be used to document the sample collection locations. The standard projection method to be used during field activities is Horizontal Datum: NAD1983_StatePlane, Texas South Central, FIPS 4204, U.S. feet. The positioning objective is to accurately determine and record the positions of all sampling locations to within ±2 m. Proposed sediment and soil sampling location coordinates are provided in Table 1. If weather and sampling substrate conditions permit, actual sample locations should fall within a 10 foot radius of the planned positions. In all cases the actual sample location coordinates should be recorded at each station.

The DGPS unit consists of a global positioning system (GPS) receiver and a differential receiver located at a horizontal control point. At the control point, the GPS-derived position is compared with the known horizontal location, offsets or biases are calculated, and the correction factors are telemetered to the GPS receiver. Positioning accuracies on the order of ±1 to 3 m can be achieved by avoiding the few minutes per day when the satellites are not providing the appropriate quality of signal. The GPS unit provides the operator with a listing of the time intervals during the day when accuracies are decreased. Avoidance of these time intervals permits the operator to maintain better positioning accuracy.

2.2.3 Surface Sediment Sample Collection

The equipment and procedures that will be used to collect surface sediment samples during the TCRA sediment study are discussed in this section. The 23 field locations that will be sampled are listed in Table 1. The holding time requirements for the sediment samples following field collection are specified in Table 2.

Surficial sediment samples (0 to 6 inches; 0 to 15 cm) may be collected with either a modified petit Ponar grab sampler or pole mounted Eckman dredge, depending on the conditions encountered in the field, in accordance with standard methods used by USEPA (1997).

Material collected with the sampling device will be evaluated by the Anchor QEA FL for acceptability using the following criteria:

- The sampler is not overfilled
- Overlying water is present (may not be applicable to exposed intertidal sediment samples collected at low tide)
- The overlying water (if present) is not excessively turbid
- The sediment surface is relatively undisturbed
- An adequate penetration depth is attained (i.e., to enable sampling of the undisturbed surface sediment)

If a sample fails to meet any of the above criteria, it will be rejected and discarded away from the station.

After a sediment sample is judged to be acceptable, any overlying water will be siphoned off and the upper 6 inches (15 cm) of sediment will be collected in accordance with (USEPA 1997) guidelines. If a grab sampler is used, then decontaminated stainless-steel spoons will be used to collect the sediment from the grab sampler. A stainless-steel ruler will be used with all sampling devices to ensure that the sampling criterion for adequate penetration depth has been met and that the correct amount (i.e., 6 inches [15 cm]) of sediment has been removed.

Surface sediments from the grab samples will be placed into a decontaminated, stainless-steel bowl and homogenized using a stainless-steel spoon or other stainless-steel mixing

implement until the sediment attains a visually uniform color and texture. Sediment subsamples will then be removed for the dioxin/furan and TOC analyses.

The surface sediment samples will be placed in labeled, laboratory-cleaned sample containers with Teflon-lined lids (Table 2). Each sample container will be clearly labeled with the task name, sample number, type of analysis to be performed, date and time, and initials of person(s) preparing the sample. Immediately after sample containers are filled, the samples will be stored on ice (4±2°C).

As stated above, the sample matrix table (Table 1) shows the analyses for each sampling station. Anchor QEA's FL and field personnel in charge of sample handling will use this table as a QC check to ensure that all samples at a given station are collected and that the appropriate sample container is used for each sample.

2.2.4 Surface Soil Sample Collection

The equipment and procedures that will be used to collect surface soil samples during the TCRA sediment study are discussed in this section. The two locations that will be sampled (Stations SJA1 and SJA2) are listed in Table 1.

Surficial soil samples (0 to 6 inches; 0-15 cm) will be collected with a soil auger. If there is a significant vegetative cover, the vegetative material will be removed prior to sampling. The thickness of the vegetative cover will be noted in the field log book. The Anchor QEA FL will ensure adequate penetration depth is attained. A stainless-steel ruler will be used to determine that the sampling criterion for adequate penetration depth has been met and that the correct amount (i.e., 6 inches [15 cm]) of soil has been removed. A decontaminated stainless-steel spoon will be used to collect the soil from the auger. Surface soil will be placed into a decontaminated stainless-steel bowl and homogenized using a stainless-steel spoon or other stainless-steel mixing implement until the soil attains a visually uniform color and texture. Soil subsamples will then be removed for dioxin/furan and TOC analyses. The surface soil samples will be placed in labeled, laboratory-cleaned sample containers with Teflon-lined lids (Table 2). Each sample container will be clearly labeled with the task name, sample number, type of analysis to be performed, date and time, and initials of

person(s) preparing the sample. Immediately after sample containers are filled, the samples will be stored on ice (4±2°C).

2.2.5 Equipment Decontamination

Before sampling begins at a location, the sampling equipment will be scrubbed with a standard detergent (e.g., Alconox® or Liquinox®), rinsed with water (river, tap, or deionized water), air-dried, and rinsed with river water. Equipment used for compositing the sediment and soil samples (i.e., stainless-steel bowls and spoons) will follow the same basic decontamination sequence, except that the final rinse will be with laboratory-grade distilled/deionized water. After cleaning, the decontaminated sample homogenizing equipment will be covered with aluminum foil to protect it from possible contamination.

All non-dedicated sampling equipment that comes into contact with the sediment samples (e.g., grab samplers, soil auger, stainless-steel bowls, and utensils) will be decontaminated prior to use and between samples. Non-dedicated sampling equipment will be decontaminated according to the procedures outlined above. If samples are collected that include obvious oily contamination, the sampling equipment used to collect and process them will be decontaminated using a separate decontamination station dedicated to heavily impacted equipment. This equipment will be wiped with a solvent following the initial decontamination, and it will undergo a second decontamination sequence using the standard decontamination procedures used for the non-oil-impacted equipment.

2.3 Field Quality Control Samples

Field QC samples will be used to assess sample variability and evaluate potential sources of contamination. The types of QC samples that will be collected for the TCRA sediment study are described in this section. The estimated numbers of field QC samples to be collected is listed in the sample matrix table (Table 1). If QC problems are encountered, they will be brought to the attention of the Integral's Laboratory QA coordinator. Corrective actions, if appropriate, will be implemented to meet the task's data quality indicators.

Field QC samples will include field split samples, standard reference materials, equipment filter wipe blanks, and filter blanks. The following QC samples will be collected in the field and analyzed by the analytical laboratory:

- Field split samples will be collected and analyzed to assess the variability associated with sample processing and laboratory variability. Blind field split samples will be collected at a minimum frequency of 1 field split sample per 20 sediment sampling stations. Samples will be assigned unique numbers and will not be identified as field splits to the laboratory. Two field splits will be collected, one from a sediment station and one from a soil station.
- Standard reference materials are samples of known concentration that have typically undergone multi-laboratory analyses using a standard method. Reference materials provide a measure of analytical performance and/or analytical method bias. Standard reference materials for the dioxin/furan analyses will be provided by the laboratory.
- Equipment filter wipe blanks will be collected to help identify possible contamination from the sampling environment or from the sampling equipment (e.g., stainless-steel spade, coring device, spoons, and bowls). Equipment filter wipe blanks will be generated at approximately 5 percent of the sediment sampling stations at a minimum. All equipment wipe samples will be clearly noted in the field log (e.g., sample identifier, equipment type, date and time of collection, analysis, and filter lot number).
- A minimum of one field equipment filter wipe blank will be collected for each kind of sampling equipment used for chemical analyses. A filter wipe blank will be collected at every twentieth station. One equipment wipe will be prepared for each analysis type. If multiple analyses are requested, separate sets of filter wipes will be collected for each analysis type and for each kind of sampling equipment used, as the equipment can be wiped down only once for each piece of filter paper. This ensures that the filter wipe result represents the most conservative estimate of cross contamination for each analysis type. (Note: Filter papers must be stored in their original box, wrapped carefully in three layers of aluminum foil, or contained in a glass jar. The filter paper box cannot be stored in plastic bags or containers.)
- Filter blanks are prepared in the field to evaluate potential background concentrations present in filter paper used for the equipment filter wipe blank. Filter blanks will be collected at a minimum frequency of one for each lot number of filter papers used for

collecting the equipment wipe blanks.

2.4 Sample Packaging and Transport

As mentioned above, sample coolers and packing materials will be supplied by the analytical laboratories. Individual sample jars will be labeled and placed into plastic bags and sealed. Samples will then be packed in a cooler lined with a large plastic bag. Glass jars will be packed to prevent breakage and separated in the cooler by bubble wrap or other shock-absorbent material. Ice in sealed plastic bags will then be placed in the cooler to maintain a temperature of approximately 4°C (±2°C). When the cooler is full, the COC form will be placed into a zip-locked bag and taped to the inside lid of the cooler. A temperature blank will be added to each cooler. Each cooler will be sealed with two COC seals, one each on the front and side of the cooler. Labels indicating "This End Up" with an arrow and "Fragile" will be attached to each cooler.

The shipping containers will be clearly labeled (i.e., name of task, time and date container was sealed, person sealing the cooler, and company name and address) for positive identification. These packaging and shipping procedures are in accordance with U.S. Department of Transportation regulations (49 CFR 173.6 and 49 CFR 173.24). Coolers containing samples for chemical analyses will be transported to the laboratory by courier or overnight shipping service.

After the chemistry samples have been received by the laboratory, they will be stored under refrigeration (4±2°C).

2.5 Study-Derived Wastes

Any excess phosphate-free, detergent-bearing liquid wastes from decontamination or any sample remaining after processing will be deposited in the vicinity of the collection area. Any dry waste (e.g., contaminated boots, bibs, Tyvek™ suits, contaminated sediments) present at the end of the sampling event will be segregated and containerized (e.g., 50-gallon drums) and disposed of by a subcontractor specialized in hazardous waste removal. The subcontractor will be required to have, at a minimum, a drum management service that provides the following:

- Proper waste identification including full analytical capability
- Pick up and disposal of a broad range of hazardous wastes
- Safe and proper transportation
- Environmentally sound treatment and disposal
- Regularly scheduled service visits with manifest and label preparation

All disposable materials used for sample collection and processing, such as paper towels and gloves, will be placed in heavyweight garbage bags or other appropriate containers. Disposable supplies that do not contain Site sediment will be removed from the Site by sampling personnel and placed in a normal refuse container for disposal at a solid waste landfill.

3 FIELD DOCUMENTATION

The integrity of each sample from the time of collection to the point of data reporting must be maintained. Proper record-keeping and COC procedures will allow samples to be traced from collection to final disposition. Representative photographs will be taken of each type of sample material are collected (e.g. pulp waste, sandy material, silty sand, soil, etc.).

3.1 Field Log Book

All field activities and observations will be noted in a log book. The field log book will be a bound document and may contain individual field and sample log forms (depending on the sampling activity). Information will include personnel, date, time, station designation, sampler, types of samples collected, and general observations. Any changes that occur during sampling (e.g., personnel, responsibilities, or deviations from the FSP) and the reasons for these changes will be documented. The log book will identify on-Site visitors (if any) and the number of photographs taken at each sampling location. The FL is responsible for ensuring that the field log book and all field data forms are correct. Requirements for log book entries will include the following:

- Log books will be bound, with consecutively numbered pages.
- Removal of any pages, even if illegible, will be prohibited.
- Entries will be made legibly with black (or dark) waterproof ink.
- Unbiased, accurate language will be used.

- Entries will be made while activities are in progress or as soon afterward as possible (the date and time that the notation is made should be recorded, as well as the time of the observation itself).
- Each consecutive day's first entry will be made on a new, blank page.
- The date and time, based on a 24-hour clock (e.g., 0900 a.m. for 9:00 a.m. and 2100 for 9:00 p.m.), will appear on each page.

In addition to the preceding requirements, the person recording the information must initial and date each page of the field log book. If more than one individual makes entries on the same page, each recorder must initial and date each entry. The bottom of the page must be signed and dated by the individual who makes the last entry.

Log book corrections will be made by drawing a single line through the original entry, allowing the original entry to be read. The corrected entry will be written alongside the original. Corrections will be initialed and dated and may require a footnote for explanation.

The type of information that may be included in the field log book and/or field data forms includes the following:

- Task name, task location, and task number
- Task start date and end date
- Weather conditions
- Name of person making entries and other field staff
- On-Site visitors, if any
- Sampling vessel, if any
- Station name and location
- Date and collection time of each sample
- The sample number for each sample to be submitted for laboratory analysis
- The sampling location name, date, gear, and sampling location coordinates derived from GPS
- Specific information on each type of sampling activity
- The sample number, date and time of collection, equipment type, and the lot number for the box of filter papers used for field QC samples
- Observations made during sample collection, including weather conditions,

complications, and other details associated with the sampling effort

- Sample description (source and appearance, such as sediment or soil type, color, presence of anthropogenic material, and presence and type of biological structures, other debris, oil sheens, and odor)
- Penetration depth (nearest 0.5 cm) based on sediment or soil depth at the center of the excavation
- Any visible debris near any of the sampling locations
- Any surface vegetation that is removed from the sampling location prior to sampling
- The locations of any surface water runoff or seeps that are located near any of the sampling stations
- The number of photographs taken at the sampling location
- A record of Site health and safety meetings, updates, and related monitoring
- Any deviation from the FSP and reasons for deviation

In addition, a sampling location map will be updated during sampling and will be maintained throughout the sampling event. All log books must be completed at the time that any observations are made. Copies of all log books and forms will be retained by the technical team.

3.2 Chain-of-Custody Procedures

Samples are in custody if they are in the custodian's view, stored in a secure place with restricted access, or placed in a container secured with custody seals. A COC record will be signed by each person who has custody of the samples and will accompany the samples at all times. Copies of the COC will be included in laboratory and QA/QC reports.
At a minimum, the form will include the following information:

- Site name
- FL's name and team members responsible for collection of the listed samples
- Collection date and time for each sample
- Sample type (i.e., sample for immediate analysis or archive)
- Number of sample containers shipped
- Requested analyses
- Sample preservation information (if any)

- Name of the carrier relinquishing the samples to the transporter, noting date and time of transfer and the designated sample custodian at the receiving facility

Anchor QEA's FL (or delegate) will be the designated field sample custodian for their respective sampling events and will be responsible for all sample tracking and COC procedures for the samples that their team collected in the field. The field sample custodian will be responsible for final sample inventory and will maintain sample custody documentation. The field sample custodian will complete COC forms prior to removing samples from the field. Upon transferring samples to the laboratory sample custodian (if a local laboratory is selected) or shipping courier (as appropriate), the field sample custodian will sign, date, and note the time of transfer on the COC forms. The original COC forms will be transported with the samples to the laboratories. All samples will be shipped to the testing laboratories in either coolers or shipping containers sealed with custody seals.

The laboratory will designate a sample custodian who will be responsible for receiving samples and documenting their progress through the laboratory analytical process. The sample custodian for the laboratory will establish the integrity of the custody seals upon sample arrival at the laboratory. The laboratory sample custodian will also ensure that the COC and sample tracking forms are properly completed, signed, and initialed upon receipt of the samples.

When the laboratory receives the samples, the laboratory sample custodian will conduct an inventory by comparing sample labels to those on the COC document. The custodian will enter the sample number into a laboratory tracking system by task code and sample designation. The custodian will assign a unique laboratory number to each sample and will be responsible for distributing the samples to the appropriate analyst or for storing samples at the correct temperature in an appropriate secure area.

3.3 Station Numbering

All stations will be assigned a unique identification code based on a designation scheme designed to suit the needs of the field personnel, data management, and data users. Station numbers will include "SJ" to indicate San Jacinto. The letters will be followed by a letter to

identify the transect (A-E) and a number to identify the station position within the transect. The station numbers will increase as the stations increase in distance from the impoundments. An example station number for the TCRA sediment study would be SJA1.

Station numbers will not be recorded on sample labels or COC forms to prevent analytical laboratories from seeing the relationships between samples and stations.

3.4 Sample Identifiers

Each sample from a given station will also have a unique label identifier. Sample identifiers will be established before field sampling begins and assigned to each sample as it is collected. Sample identifiers consist of codes designed to fulfill two purposes: 1) to identify related samples (i.e., field split samples) to ensure proper data analysis and interpretation; and 2) to track individual sample containers to ensure that the laboratory receives all of the material associated with a single sample. To accomplish these purposes, each container is assigned a sample number and a tag number. These codes and their uses are described below:

- A sample identifier for each surface sample will be created as follows: the station number (e.g., SJA1), followed by a two-letter code for the kind of sample collected at a given location (SG = sediment grab sample and SL = soil sample).
- Following the sample identifier, an alphanumeric identifier will follow, indicating sample type. "N" will designate normal samples; "D" will designate a homogenized split sample (e.g. SJA1-SG-N).

For equipment filter wipe blanks, sequential numbers starting at 900 will be assigned instead of station numbers. For example, the first filter wipe blank for a surface sediment sample collected with a stainless steel spoon and stainless steel bowl will be labeled as SDFW-901G (SD = sediment, SL = soil, FW = filter wipe, G = grab sampler, A = soil auger).

4 FIELD DATA MANAGEMENT AND REPORTING PROCEDURES

During field operations, effective data management is critical to providing consistent, accurate, and defensible data and data products. Daily field records (a combination of field log books, field forms, if any, and COC forms) will make up the main documentation for field activities. Upon completion of sampling, field notes, data sheets (if any), and COC forms will be scanned to create an electronic record. Field data will be manually entered into the project database. One hundred percent of the transferred data will be verified based on hard copy records. Electronic QA checks to identify anomalous values will also be conducted following entry.

5 REFERENCES

Anchor QEA, 2009. Health and Safety Plan San Jacinto River Waste Pits Superfund Site. Prepared for McGinnes Industrial Maintenance Corporation, International Paper Company, and U.S. Environmental Protection Agency, Region 6. Anchor QEA, Ocean Springs, MS.

TCEQ and USEPA, 2006. Screening Site Assessment Report San Jacinto River Waste Pits, Channelview, Harris County, Texas. TXN000606611. Texas Commission on Environmental Quality and U.S. Environmental Protection Agency.

USEPA, 1997. Recommended Quality Assurance and Quality Control Guidelines for the Collection of Environmental Data in Puget Sound. In: Recommended protocols for measuring selected environmental variables in Puget Sound. U.S. Environmental Protection Agency, Puget Sound Estuary Program, Seattle, WA.

Table 1
Sample Collection Matrix

Station ID	Sample ID	Sample Matrix	Depth Interval (in)	Station Coordinates[a]		Dioxins/Furans	TOC
				Easting	Northing		
SJA1	SJA1-SL-N	Soil	0-6	-95.0634	29.7949	X	X
SJA2	SJA2-SL-N	Soil	0-6	-95.0636	29.7950	X	X
SJA3	SJA3-SG-N	Sediment	0-6	-95.0639	29.7954	X	X
SJA4	SJA4-SG-N	Sediment	0-6	-95.0641	29.7955	X	X
SJA5	SJA5-SG-N	Sediment	0-6	-95.0643	29.7957	X	X
SJB1	SJB1-SG-N	Sediment	0-6	-95.0628	29.7957	X	X
SJB2	SJB2-SG-N	Sediment	0-6	-95.0630	29.7958	X	X
SJB3	SJB3-SG-N	Sediment	0-6	-95.0633	29.7962	X	X
SJB4	SJB4-SG-N	Sediment	0-6	-95.0635	29.7964	X	X
SJB5	SJB5-SG-N	Sediment	0-6	-95.0636	29.7966	X	X
SJC1	SJC1-SG-N	Sediment	0-6	-95.0624	29.7955	X	X
SJC2	SJC2-SG-N	Sediment	0-6	-95.0623	29.7957	X	X
SJC3	SJC3-SG-N	Sediment	0-6	-95.0622	29.7962	X	X
SJC4	SJC4-SG-N	Sediment	0-6	-95.0621	29.7964	X	X
SJC5	SJC5-SG-N	Sediment	0-6	-95.0620	29.7966	X	X
SJD1	SJD1-SG-N	Sediment	0-6	-95.0616	29.7946	X	X
SJD2	SJD2-SG-N	Sediment	0-6	-95.0613	29.7948	X	X
SJD3	SJD3-SG-N	Sediment	0-6	-95.0609	29.7950	X	X
SJD4	SJD4-SG-N	Sediment	0-6	-95.0607	29.7951	X	X
SJD5	SJD5-SG-N	Sediment	0-6	-95.0605	29.7953	X	X
SJE1	SJE1-SG-N	Sediment	0-6	-95.0621	29.7939	X	X
SJE2	SJE2-SG-N	Sediment	0-6	-95.0619	29.7938	X	X
SJE3	SJE3-SG-N	Sediment	0-6	-95.0613	29.7937	X	X
SJE4	SJE4-SG-N	Sediment	0-6	-95.0611	29.7936	X	X
SJE5	SJE5-SG-N	Sediment	0-6	-95.0609	29.7935	X	X
Field Quality Assurance / Quality Control Samples							
SJ##	SJ##-##-D		0-6	TBD	TBD	X	X
SJ##	SJ##-##-D		0-6	TBD	TBD	X	X
SDFW-901G	SDFW-901G	NA	NA	NA	NA	X	
SOFW-902A	SLFW-902A	NA	NA	NA	NA	X	
Filter Blank	FB-903	NA	NA	NA	NA	X	
SRM	SRM-904	NA	NA	NA	NA	X	

a - Station Coordinates are State Plane coordinates based on North American Datum (NAD) 83 for Texas, South Central

TDB - To be determined

SRM - Standard Reference Material

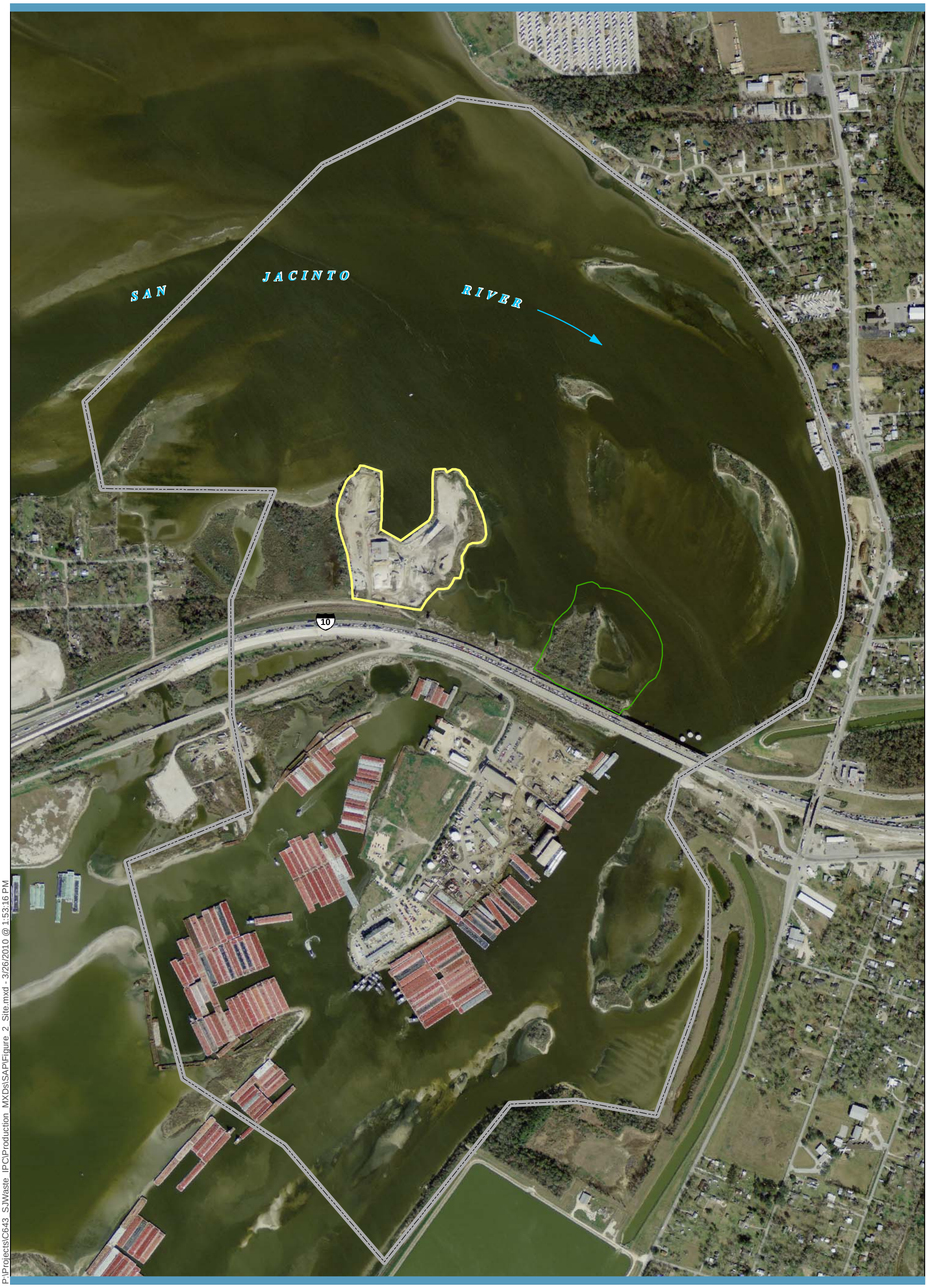
Table 2
Sample Containers, Preservation, and Holding Time Requirements

Matrix	Container [a] Type	Container [a] Size	Laboratory	Parameter	Preservation	Holding Time	Sample Size [b]
Sediment/Soil							
	WMG	4 oz.	TBD	TOC	4±2°C	28 days	1 g
	WMG	8 oz.	TBD	Dioxins/furans	4±2°C/Deep frozen (-20°C) [c] / -10°C [d]	1 year/1 year [e]	50 g
Equipment Filter Wipe Blanks							
	AG	4 oz.	TBD	Dioxins/furans	4±2°C	1 year/1 year [e]	3 wipe

Notes

AG = amber glass
WMG = wide mouth glass
TBD = to be determined

a - The size and number of containers may be modified by the analytical laboratory.
b - Sample sizes may be modified once laboratory selection is made.
c - Samples will be shipped to the laboratory on ice at 4±2°C. Once received at the laboratory, samples will be stored at -20°C.
d - Extracts will be stored at -10°C.
e - Holding time for samples prior to extraction/ holding time for extracts.



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ANCHOR QEA

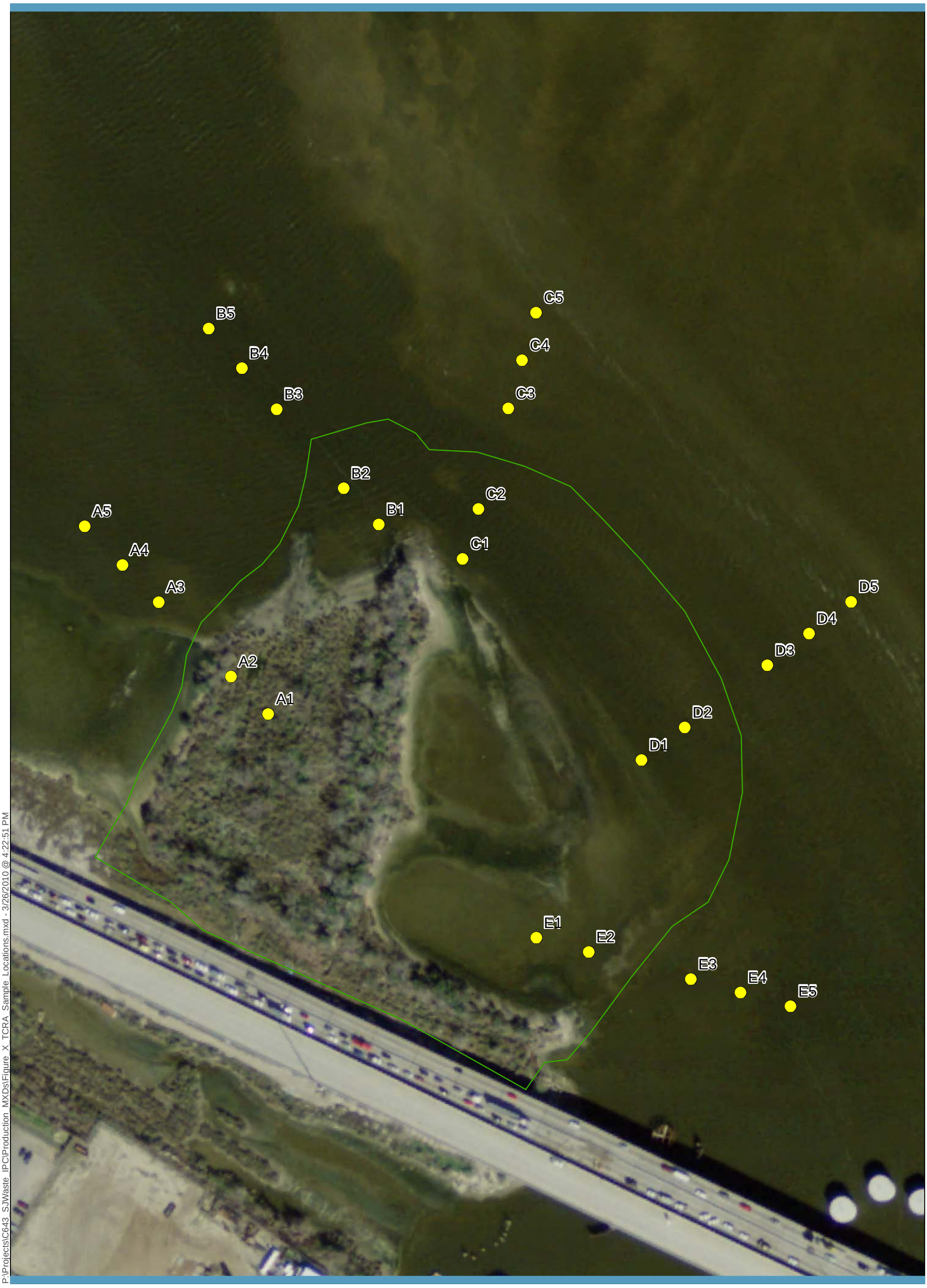
integral consulting inc.

Preliminary Site Perimeter
Upland Sand Separation Area
Original (1966) Perimeter of the Impoundments

0 800
Scale in Feet

FEATURE SOURCES:
Aerial Imagery: 0.5-meter January 2009 DOQQs - Texas Strategic Mapping Program (StratMap), TNIS

Figure 1
Overview of Current Site
TCRA Sediment Field Sampling Plan
SJRWP Superfund/MIMC and IPC



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ANCHOR QEA integral consulting inc.

0 200

Scale in Feet

TCRA Sample Locations

Preliminary Site Perimeter

Original (1966) Perimeter of the Impoundments

FEATURE SOURCES:
Aerial Imagery: 0.5-meter January 2009 DOQQs - Texas Strategic Mapping Program (StratMap), TNIS

Figure 2

TCRA Sample Locations
TCRA Sediment Field Sampling Plan
SJRWP Superfund/MIMC and IPC